RECONSTRUCTION EXPERIMENT OF THE TRANSDUCTION BETWEEN SINGLE H-PHASE IN SALMONELLA. II

Report by Tetsuo Iino

April 10, 1956

In the previous reconstruction experiment, the possibilities that the masked transduction types are not recovered because of inhibition by the antiserum added to selective media, and that the appearance of exceptional types is caused by the phase variation in recipient cultures during experiment, have not been tested. The present experiment was designed to test these posibilities.

Materials and experimental procedures were listed in Table 1.

The average no. of colonies on each series of plates are shown in Table 2, and the no. of swarms recovered from brushes are shown in Table 3, with their antigen types and galactose character.

From the data of Table 2, numbers of each type of cells in original culture, in mixed suspension and in brushes are calculated as follows:

Volume of loop = $\frac{24.8}{47.4} \times 10^{-2} = 5.2 \times 10^{-3}$ (ml)

Conc. of original cultures (per ml)

b:(1.2)Gal^+ = $65.2 \times 5 \times 10^7 = 3.3 \times 10^9$

(b):1.2Gal^- = $37.6 \times 5 \times 10^7 = 1.9 \times 10^9$

i: 1.2Gal^+ = $47.4 \times 5 \times 10^7 = 2.4 \times 10^9$

Conc. in mixed suspension (per ml)

b:(1.2)Gal^+ = $65.2 \times \frac{0.25}{0.02} = 8.2 \times 10^2$

(b):1.2Gal^- = $37.6 \times \frac{0.25}{0.02} = 4.7 \times 10^2$

i:1.2 Gal^+ = $2.4 \times 10^9 \times 0.5 = 1.2 \times 10^9$

No. of cells in 15 brushes

b:(1.2)Gal^+ = $8.2 \times 10^2 \times 5.2 \times 10^{-3} \times 15 \times \frac{19}{20} = 61$

(b):1.2 Gal^+ = " " " " " $\times \frac{1}{20} = 3$

b:(1.2)Gal^- = $4.7 \times 10^2 \times 5.2 \times 10^{-3} \times 15 \times \frac{1}{20} = 2$

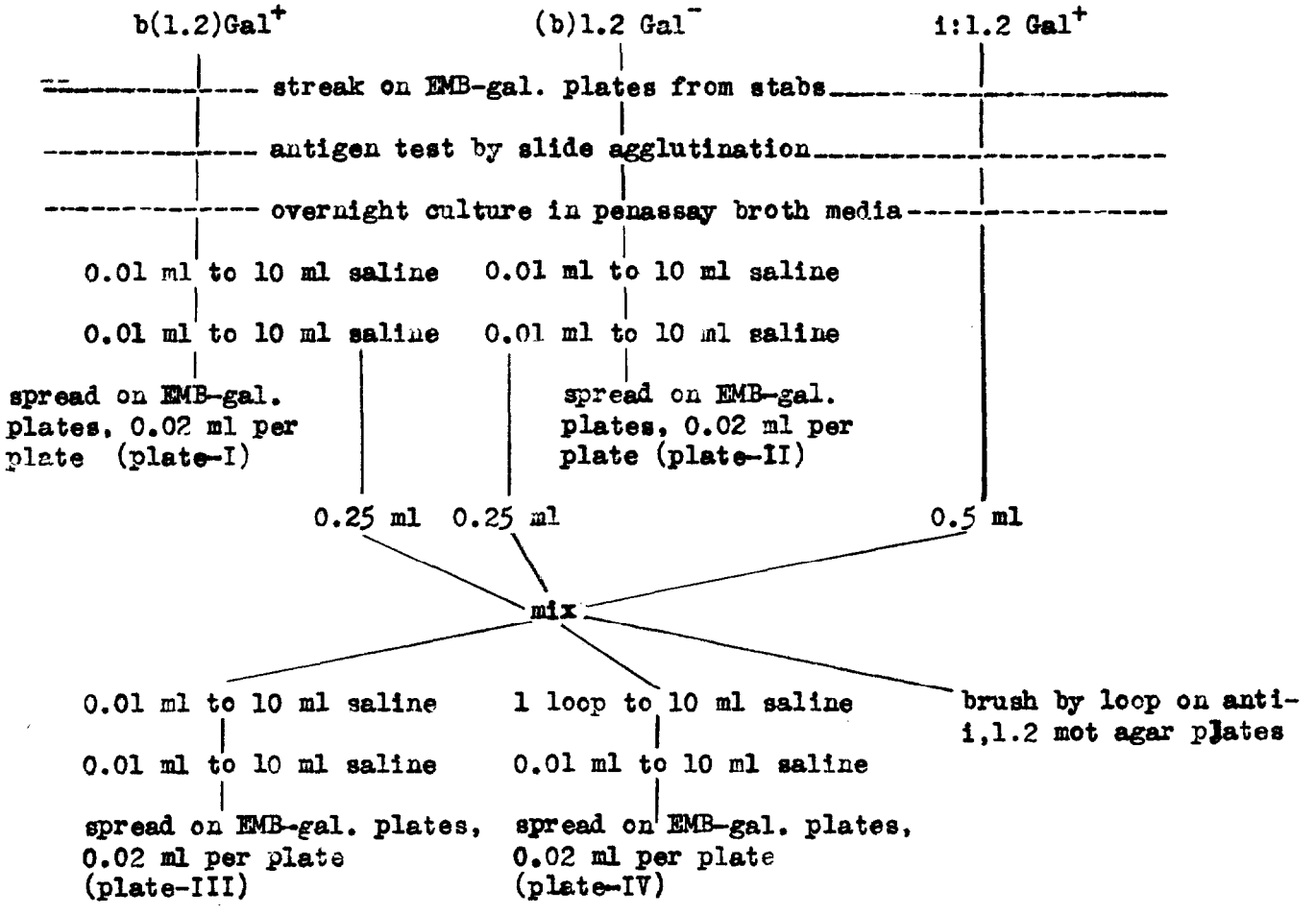
(b):1.2 Gal^- = " " " " " $\times \frac{19}{20} = 35$

The final results are summarized in Table 4. The results clearly show the masking of Gal^-(b):1.2 cells by anti i,1.2 mot agar plate, and the growth of swarms of exceptional type (Gal^- swarms in this experiment) due to phase variation happened during the coumse of experiment. The ratio of Gal^+b:(1.2) to Gal^- b:(1.2) recovered by anti i,1.2 mot agar selection in this experiment agree quite well with the corresponding ratio in transduction experiment (see Table 4. $X^2 = 0.074$, $0.7 < p < 0.8$).

Table 1.

Procedures of the reconstruction experiment.

Sal. typhimurium



* 5 plates were used for the epieay count.

Table 2.

Average number of colonies per plate (average of 5 plates)

Plate no.	Culture	Average no.	Antigen type of colonies
I	b;(1.2)Gal$^+$	65.2	b:19/20 1.2:1/20
II	(B):1.2Gal$^-$	37.6	b: 1/20 1.2:19/20
III	i:1.2 Gal$^+$ (0.01 md pipette)	47.4	i: 6/20 1.2:14/20
IV	i:1,2 Gal$^+$ (loop)	24.8	

Table 3.

Number of swarms and their galactose character.

Brush no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Gal$^+$b:(1.2)	5	2	2	3	1	7	9	7	6	4	3	5	7	3	5	69
Gal$^-$b:(1.2)	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	2
Total	5	2	3	3	1	7	9	8	6	4	3	5	7	3	5	71

Table 4.

Summary of the results

Number of cells of each types

	Calculated from colony count of EMB-plated (per 15 brushes)	Recovered from 15 brushes by anti i,1.2 mot agar selection	Corresponding no. from transduction experiment (no. of brush differ)
Gal$^+$b(1.2)	61	69	133
Gal$^+$(b)1.2	3	/	/
Gal$^-$b(1.2)	2	2	3
Gal$^-$(b)1.2	35	/	/